3.11 Overall Assessment of Data Useability

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable, except where flagged with data qualifiers that modify the usefulness of the individual values.

4.0 Data Validation of 4,4'-DDD Analyses by HPLC Fractionation Cleanup and GC/MS Selective Ion Monitoring

4.1 Custody, Preservation, Holding Times, and Completeness – Acceptable with Discussion

All samples were extracted and analyzed within the required holding times. Except as noted below, all samples were received intact and were properly preserved. The data packages are complete and contain all the information necessary to recreate the sample results.

The original 4,4'-DDD result reported for sample SE050600MHB 033 (BU62A) was incorrect. The laboratory resubmitted a corrected organics analysis data sheet.

The 4,4'-DDD spectra for sample SE050600MHB 036 (BU62D) was missing from the data package. The laboratory resubmitted the missing information.

The sample extracts for SDG BZ19 were not kept cold during transport. The un-iced extracts were sent from ARI, via United Parcel Service, taking 4 days to arrive at DMD. Data qualifiers are not recommended.

4.2 Instrument Tuning and Mass Calibration – Acceptable

The tuning compound decafluorotriphenylphosphine was analyzed at the required frequency and all relative abundance values are within QA2 criteria.

4.3 Initial Calibration – Acceptable

Initial calibrations were analyzed at the required frequency and were correctly calculated. The QA2 criteria of RSD values less than 20 for nonpolar analytes and less than 30 for polar analytes, and response factors greater than 0.05, were met.

4.4 Continuing Calibration – Acceptable

Continuing calibration verifications (CCVs) were analyzed at the required frequency and are correctly calculated. All percent difference values and relative response factors meet the QA2 criteria of less than 25% and greater than 0.05, respectively.

4.5 Blank Analyses – Acceptable

4.5.1 Method Blanks

Method blanks were analyzed at the required frequency and target analytes were not detected above the reporting limit.

4.5.2 Field Blanks

The field blank was not analyzed by selective ion monitoring.

4.6 Surrogate Analyses – Acceptable with Discussion

Surrogate compounds were added to all samples, blanks and QC samples as required and are correctly calculated. Except as noted below, all surrogate recovery values are within the laboratory's control limits.

The 4,4'-DDD-d_4 surrogate recovery from sample SE050600MHB 033 (BU62A) is above the laboratory control limits at 177%. Data qualifiers are not required because this sample was re-extracted and reanalyzed (as BZ19A).

The 4,4'-DDD-d_4 surrogate recovery from the LCS associated with sample delivery group (SDG) BZ19 is below the laboratory's control limits at 23.1%. Data qualifiers are not required for QC samples.

4.7 Matrix Spike/Matrix Spike Duplicate Analyses – Discussion

Except as noted below, MS/MSD analyses were performed at the required frequency, are correctly calculated, and all percent recovery and RPD values are within the SAP criteria.

The laboratory did not analyze a MS/MSD pair with the SIM analyses. Data qualifiers are not required.

4.8 Laboratory Control Sample Analyses – Acceptable with Qualifications

Laboratory control samples were analyzed with each batch and the results are correctly calculated. Except as noted below, all percent recovery values are within the QA2 criteria of 50 to 150%.

The recovery of 4,4'-DDD from the LCS associated with SDG BU62 is below the QA2 criteria at 24.3%. Positive results have been qualified as estimated (J) and non-detected results have been qualified as estimated detection limit (UJ) as shown in the following table.

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE050600MHB 036 (BU62D)	4,4'-DDD	UE	LCS recovery < 50%

4.9 Certified Reference Material Analyses

Certified reference material analyses are not required by the SAP and were not performed.

4.10 Internal Standard Evaluation – Acceptable

Internal standards were added to all samples, blanks, and QC samples as required and the recovery and retention time criteria of Functional Guidelines were met.

4.11 Compound Quantitation and Laboratory Reporting Limits – Acceptable with Discussion

The final results are correctly calculated including percent moisture, amount extracted, and dilution factors. The QA2 relative retention time and mass spectral criteria were met.

The SAP target detection limits were not met for sample SE050600MHB 036 (BU62D). The 4,4'-DDD reporting limit (19 ug/kg) is above the SAP target detection limit (16 ug/kg).

4.12 Field Duplicates

Field duplicates are not associated with this set of samples.

4.13 Overall Assessment of Data Useability

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

5.0 Data Validation of Aroclors by HPLC Fractionation Cleanup and GC/ECD Analysis

5.1 Custody, Preservation, Holding Times, and Completeness – Acceptable with Discussion

All samples were extracted and analyzed within the required holding times. Except as noted below, all samples were received intact and were properly preserved. The data package is complete and contains all the information necessary to recreate the sample results.

The sample extracts for SDG BZ19 were not kept cold during transport. The un-iced extracts were sent from ARI, via United Parcel Service, taking 4 days to arrive at DMD. Data qualifiers are not recommended.

The Aroclor quantitation report and chromatogram for the CCV analyzed on 9-2-00 at 17:46 were missing from the data package. The laboratory resubmitted the missing pages.

5.2 Initial Calibration and Performance Evaluation Checks – Acceptable

Initial calibrations and performance evaluation checks were analyzed at the required frequency and are correctly calculated. The QA2 linearity criteria (RSD $\leq$ 20% for pesticides and $\leq$ 30% for multicomponent analytes) and Functional Guidelines performance evaluation criteria were met.

5.3 Calibration Verifications – Acceptable with Qualifications

Continue calibration verifications were analyzed at the required frequency and are correctly calculated. Except as noted below, the QA2 criteria of percent difference values less than or equal to 15% was met.

The percent difference value of the 1260-2 and 1260-3 peaks on the RTC-CLP1 column and the 1260-4 peak on the RTX-CLP2 column are above the QA2 criteria at 15.6%, 19.0% and 17.9%, respectively. Since the response decreased, the Aroclor 1260 results in the associated samples were qualified as estimated (E) or estimated detection limit (UE) as shown in the following table.

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE050600MHB 033 (BZ19A) SE050600MHB 036 (BZ19D)	Aroclor 1260	UE	CCV percent difference > 15 (response decreased)

5.4 Blank Analyses – Acceptable

5.4.1 Method Blanks

Method blanks were analyzed at the required frequency and target analytes were not detected above the reporting limit.

5.4.2 Field Blanks

Sample SE050600MHB was identified as a field blank. Target analytes were not detected above the reporting limits.

5.5 Surrogate Analyses – Acceptable with Qualifications

Except as noted below, surrogate compounds were added to all samples, blanks and QC samples as required, are correctly calculated, and all percent recovery values are within laboratory's control limits.

The DCBP recovery values from both columns for sample SE050600MHB 033 (BZ19A) are above the laboratory's control limits. The laboratory reported the value as NR. The percent recovery values are greater than 700% due to positive chromatographic interferences. Data qualifiers are not required because the TCMX surrogate recovery values are acceptable.

The TCMX and DCBP recovery values in sample SE050600MHB 036 (BZ19D) were reported as NR. The percent recovery values are greater than 300% due to positive chromatographic interferences. Since positive results were not reported, data qualifies are not required.

The TCMX recovery value for the LCS is below the laboratory's control limits at 1.2%. Data qualifiers are not required for QC samples.

The correct surrogate compounds were not added to the fractionated extracts of SDG BU62. The Aroclor results of samples SE050600MHB 033 (BU62A) and SE050600MHB 036 (BU62D) were rejected in favor of the re-extracted results (from SDG BZ19).

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE050600MHB 033 (BU62A) SE050600MHB 036 (BU62D)	All Aroclors	R (in favor of reanalysis)	Surrogates not added

5.6 Matrix Spike/Matrix Spike Duplicate Analyses – Acceptable with Discussion

Except as noted below, MS/MSD analyses were performed as required, re correctly calculated, and all percent recovery and relative percent difference values are within the SAP criteria.

The laboratory did not analyze a MS/MSD pair with the samples. Data qualifiers are not required.

5.7 Laboratory Control Sample Analysis – Acceptable with Qualifications

Laboratory control samples were analyzed as required and are correctly calculated. Except as noted below, all percent recovery values are within the QA2 criteria of 50 to 150%.

The recovery of the Aroclor 1242 from the LCS associated with SDG BZ19 is below the QA2 criteria at 29.8%. Positive results have been qualified as estimated (E) and non-detected results have been qualified as estimated detection limit (UE) as shown in the following table.

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE050600MHB 033 (BZ19A) SE050600MHB 036 (BZ19D)	Aroclor 1242	UE	LCS recovery < 50%

5.8 Certified Reference Material Analyses

Certified reference material analyses are not required by the SAP and were not performed.

5.9 Compound Quantitation and Detection Limits – Acceptable with Discussion

The final results are correctly calculated, including the amount extracted, percent moisture content, and dilution factors. The retention time criteria and percent difference between column results meet the requirements of Method 8081A (USEPA 1995).

The SAP target detection limits were met for all analytes.

The validation chemist reviewed the chromatograms for multicomponent analytes, i.e., Aroclors. Due to the complex nature of the samples, the amount of non-target-analyte material present in the chromatograms, and the small size of the hard copy chromatograms, it is difficult to absolutely verify what, if any, Aroclor patterns are present in the samples. In the opinion of the validation chemist, the expertise of the laboratory staff and their ability to electronically manipulate the chromatograms (overlay, expand, etc.), should be relied upon for the determination of Aroclor results.

5.10 Field Duplicates

Field duplicates are not associated with this set of samples.

5.11 Overall Assessment of Data Useability

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

6.0 Summary of Condensed 4,4'-DDD and Aroclor Results

Because the 4,4'-DDD and Aroclor results and detection limits exceed the sediment quality objectives, samples SE050600MHB 033 and SE050600MHB 036 were re-extracted, cleaned up via HPLC fractionation, and reanalyzed. SDG BU62 was the first set of fractionated results. Due to the low LCS recovery (24.3%) and lack of surrogates in the Aroclor fractions, the samples were extracted, fractionated, and analyzed again (as SDG BZ19).

The following table lists the results that were not used, i.e., rejected. The objective was to use the result with the highest level of quality control and lowest reporting limit.

Sample ID	Analyte	Qualification	QC Exceedance
SE050600MHB 033 (BS55A) SE050600MHB 036 (BS55D)	4,4'-DDD All Aroclors	R	Rejected in favor of fractionated analysis
SE050600MHB 033 (BU62A) SE050600MHB 036 (BU62D)	All Aroclors	R	Rejected in favor of re-extracted analysis
SE050600MHB 033 (BU62A)	4,4'-DDD	R	Rejected in favor of re-extracted analysis

7.0 Data Validation of Metals by Method 6010 and Mercury by Method 7471

7.1 Custody, Preservation, Holding Times, and Completeness – Acceptable

All samples were analyzed within the required holding times and all samples were received intact and were properly preserved. The data package is complete and contains all the information necessary to recreate the sample results.

7.2 Initial Calibration – Acceptable

Initial calibrations were analyzed as required and all quality control checks met QA2 requirements.

7.3 Calibration Verifications – Acceptable

Initial calibration verifications and continuing calibration verifications were analyzed at the required frequency and are correctly calculated. All QA2 criteria were met.

7.4 Blank Analyses – Acceptable with Qualifications

7.4.1 Method Blanks

Instrument and method blanks were analyzed at the required frequency. Except as noted below, target analytes were not detected above the reporting limit.

Zinc was detected in the method blank associated with the sediment samples at 3.5 mg/kg. As specified in the QA2 Guidance Manual, the zinc results in the sediment samples have been qualified B. Associated sample results have not been blank corrected.

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Zinc	B positive results	Analyte present in associated method blank

7.4.2 Field Blanks

Sample SE060500MHB was identified as a rinsate blank. Target analytes were not detected above the reporting limit.

7.5 ICP Interference Check – Acceptable with Qualifications

ICP interference check samples (ICS) were analyzed at the required frequency and are correctly calculated. All percent recovery values are within QA2 criteria. Except as noted below, all non-spiked analytes have absolute values less than the instrument detection limit (IDL).

The lead and arsenic concentrations in the ICS analyses associated with the sediment samples have negative values greater than the IDL. Since the QA2 Guidance Manual does not provide specific instructions for qualifying due to ICS problems, Functional Guidelines was used. Functional Guidelines provides two qualifying schemes for negative results greater than the IDL. In the first, when the negative value is greater than the IDL but less than 2 times the IDL, and the associated samples contain comparable levels of interfering elements (calcium, aluminum, magnesium, and iron), non-detected results are qualified as estimated detection limit (UE). And in the second, when a negative value is greater than two times the IDL, and greater than 10% of the associated sample concentration, and when the associated samples contain comparable levels of interfering elements, positive results are qualified as estimated (E) and non-detected results are qualified as estimated detection limit (UE) in the associated samples. Since the sediment samples contained comparable levels of interferents they were qualified as shown in the following table.

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Lead	E	Negative ICS concentration > 2X IDL and > 10% of sample result and comparable levels of interfering elements present
SE060500MHB 033	Arsenic	UE	Negative ICS concentration > IDL and comparable levels of interfering elements present

7.6 Duplicate Sample Analysis – Acceptable with Qualifications

Sample duplicate analyses were performed at the required frequency and all results and RPD values are correctly calculated. Except as noted below, all RPD values are within the SAP criteria of less than 35%.

The RPD value for mercury in the duplicate analysis of sample SE060500MHB 033 is above the SAP criteria at 46.2%. The positive mercury result of sample SE060500MHB 033 was qualified as estimated (E).

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE060500MHB 033	Mercury	E	Sample duplicate RPD value > 35

7.7 Spike Sample Analysis – Acceptable with Qualifications

Matrix spike analyses were performed at the required frequency and all results and percent recovery values are correctly calculated. Except as noted below, all percent recovery values are within the SAP criteria of 75 to 125%.

The antimony recovery in the spiked analysis of sample SE060500MHB 033 is 16.4%. Due to the pattern of low recovery in the CRM and matrix spike, all sediment sample results have been qualified as quantitatively questionable (Q) or undetected results have been qualified as unusable (R).

The mercury and zinc recovery in the spiked analysis of sample SE060500MHB 033 are below the SAP criteria at 71.4% and 49.0%, respectively. As specified in the QA2 Guidance Manual, when the recovery is below 75%, associated sample results are qualified as underestimated (G) or estimated detection limit (UE).

The chromium and iron recovery in the spiked analysis of sample SE060500MHB 033 are above the SAP criteria at 556% and 141%, respectively. Data qualifiers are not required because the native sample concentrations are greater than 65 times the spike concentrations.

Sample ID	Analyte	Quality Control Exceedance	Qualification
All sediments	Antimony	Matrix spike recovery < 30%	Q positive results R detection limits
SE060500MHB 033	Mercury Zinc	Matrix spike recovery < 75%	G positive results UE detection limits

7.8 ICP Serial Dilution Analysis – Acceptable

Serial dilutions were performed as required and are correctly calculated. The QA2 criteria of percent difference values less than 10% for results greater than 10 times the IDL were met.

7.9 Certified Reference Material Analyses – Acceptable with Qualifications

Certified reference materials were analyzed as required and are correctly calculated. Except as noted below, all percent recovery values are within the QA2 criteria of 80 to 120%.

The antimony recovery in the CRM associated with the sediment samples is below QA2 criteria at 64.7%. Due to the pattern of low recovery in the CRM and matrix spike, the associated sample results are qualified as questionable (Q) or rejected (qualified R).

The iron recovery in the CRM associated with the sediment samples is above QA2 criteria at 124%. Associated sample results are qualified as estimated (E).

Sample ID	Analyte	QC Exceedance	Qualification
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Antimony	Pattern of low recovery	Q positive results R detection limits
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Iron	CRM recovery > 120%	E positive results

7.10 Compound Quantitation and Detection Limits – Acceptable

The final results are correctly calculated including percent moisture, amount digested, and dilution factors. The SAP target detection limits were met.

7.11 Field Duplicates

Field duplicates are not associated with this set of samples.

7.12 Overall Assessment of Data Useability

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

8.0 Data Validation of Conventional Chemistry Analyses

8.1 Custody, Preservation, Holding Times, and Completeness – Acceptable with Discussion

Except as noted below, all samples were analyzed within the required holding times. All samples were received intact and were properly preserved. The data package is are complete and contains all the information necessary to recreate the sample results.

The total organic carbon (TOC) raw data was missing from the data package. The laboratory resubmitted the missing information.

The TOC analysis of all samples was performed four days past the 14 day hold time for refrigerated samples (PSDDA 1999). Positive results have been qualified as estimated (E) and non-detected results have been qualified as estimated detection limit (UE).

Sample ID	Analyte	Qualification	Quality Control Exceedance
SE050600MHB 033 SE050600MHB 034 SE050600MHB 035 SE050600MHB 036	TOC	E positive results UE detection limits	Hold time exceeded

8.2 Initial Calibration – Acceptable

Initial calibrations were performed as required and are correctly calculated. All quality control criteria were met.

8.3 Calibration Verifications – Acceptable

Initial calibration verifications and continuing calibration verifications were analyzed as required for TOC and are correctly calculated. All quality control criteria were met.

8.4 Blank Analyses – Acceptable

8.4.1 Method Blanks

Method blanks were analyzed at the required frequency and target species were not detected above the reporting limits.

8.4.2 Field Blanks

The field blank was not analyzed for conventional chemistry parameters.

8.5 Replicate Sample Analyses – Acceptable

Sample triplicates were analyzed at the required frequency and are correctly calculated. All relative standard deviation (RSD) values are within the QA2 criteria of less than 20%.

8.6 Matrix Spike Analyses – Acceptable

Matrix spike analyses were performed as required for TOC and all percent recovery values are within the QA2 criteria of 75% to 125%.

8.7 Laboratory Control Sample Analyses

Laboratory control sample analyses were not reported with the data. LCS analyses are not required by the QA2 Guidance Manual or the SAP.

8.8 Certified Reference Material Analyses – Acceptable

Certified reference materials were analyzed as required for TOC and are correctly calculated. All percent recovery values meet the QA2 criteria of 80 to 120%.

8.9 Result Calculation and Detection Limits – Acceptable with Discussion

The final results are correctly calculated including percent moisture and dilution factors. The reporting limits for TOC meet the SAP minimum detection limits.

The grain size case narrative states that less than 5 grams of fines of sample SE050600MHB 033 was present in the pipette during analysis. Data qualifiers are not required because all other QC parameters are acceptable.

8.10 Field Duplicates

Field duplicates are not associated with this set of samples.

8.11 Overall Assessment of Data Useability

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

9.0 Assessment of Data Quality Objectives

9.1 Precision

Precision is a measure of the mutual agreement among individual measurements of the same property, under prescribed similar conditions. Precision is determined through analysis of matrix spike/matrix spike duplicates, sample duplicates and field duplicate samples. Duplicate samples are evaluated for precision in terms of relative percent difference. Relative percent difference is defined as the difference between the duplicate results divided by the mean and expressed as a percent.

The precision of the pesticide/PCB and conventional chemistry data meet the DQO set forth in the SAP. Laboratory precision, as shown by the MS/MSD RPDs, sample duplicate RPDs, and sample triplicate RSDs, is acceptable. Field duplicates are not associated with the samples.

The precision of the semivolatile organic data meets the SAP DQO. The high pyrene RPD value of the MS/MSD does not impact the precision of the data set because the MS and MSD results are above the calibration range.

The precision of the metals data meets the SAP DQO, with the exception of mercury. The mercury RPD value in the laboratory duplicate is above the SAP criterion.

The precision of the fractionated 4,4'-DDD and Aroclor data set is unknown. Since the laboratory did not analyze MS/MSDs or sample duplicates and field duplicates were not collected with the samples, precision can not be assessed.

9.2 Accuracy

Accuracy is the degree of agreement between a measurement and the accepted reference or true value. The level of accuracy is determined by examination of surrogates, matrix spikes, matrix spike duplicates, laboratory control samples, CRMs, method blanks, and field blanks. The surrogate, matrix spike, matrix spike duplicate, CRMs, and laboratory control sample recovery values were compared to the criteria set forth in the SAP, the QA2 Guidance Manual, Functional Guidelines, or the analytical method. Method and field blanks are analyzed to identify compounds that could be introduced during the sampling, laboratory extraction, or analysis phase (i.e., laboratory contaminates) and lead to inaccurate results.

The accuracy of the conventional chemistry data meets the SAP DQO. All matrix spikes, CRMs, and method blanks are acceptable.

The accuracy of the semivolatile organics data meets the SAP DQO. The overall accuracy is not impacted by the out-of-criteria surrogate recovery values because only one surrogate per sample is affected. The zero percent recovery of pyrene from the MS does not impact accuracy because the sample and MS results are above the calibration range. The impact of the field blank contamination is minimal because the equivalent sample concentrations are less than 5 times the actual sample concentrations. The LCSs are acceptable and the method blanks are free of contamination.

The accuracy of the pesticide/PCB data meets the SAP DQO, with one exception. The results of sample SE050600MHB 034 may be biased high as shown by the high surrogate recovery values. The results of sample SE050600MHB 034 have been qualified as estimated. Several other samples have surrogate recovery values outside the laboratory's control limits. Since only one surrogate recovery is out-of-criteria , the accuracy of the data set is not impacted. The gamma-BHC recovery values in the MS/MSD are above the SAP criteria, however, since the MS and MSD results are above the calibration range, the data are not impacted. The LCSs are acceptable and the method blanks and field blank are free of contamination.

The accuracy of the fractionated 4,4'-DDD data set is mixed. For SDG BU62, associated with sample SE050600MHB 036 only, the low LCS recovery indicates a low bias to the results. The recovery of the BZ19 LCS is acceptable, the surrogate recovery values are within criteria, and the method blanks are free of contamination. MS/MSDs were not analyzed with the fractionated samples.

The accuracy of the fractionated Aroclor data set is mixed. The low LCS recovery of Aroclor 1242 indicates a low bias to the results. Sample SE050600MHB 033 has high recovery of DCBP, but since the TCMX recovery is acceptable, the data are not impacted. Sample SE050600MHB 036 had high surrogate recovery values, however, since positive results were not reported, the accuracy of the results is acceptable. The method blanks are free of contamination. MS/MSDs were not analyzed with the fractionated samples.

The accuracy of the metals data meets the DQO set forth in the SAP, with the exception of antimony and iron. The antimony recovery in the CRM and matrix spike associated with the sediments are below the QA2 and SAP criteria, respectively. Since the matrix spike recovery is below 30%, all associated samples were qualified as quantitatively questionable (Q) or unusable (R). The pattern of low matrix spike and CRM recovery indicates the antimony data are biased low. The iron recovery in the CRM is above the QA2 criteria, indicating a high bias to the iron results of all samples. Mercury and zinc recovered low from the matrix spike, indicating a potential low bias to the spiked sample (SE050600MHB 033) results. Zinc was detected in the sediment method blank. Since the blank concentration is less than 5 times the sample concentrations, the impact of the zinc contamination on the sample results is minimal. The field blank is free of metals contamination.

9.3 Representativeness

Representativeness is the extent to which the data reflect the actual contaminate levels present in the samples. Representativeness is assessed through method and field blanks, and proper preservation and handling. Method and field blank analyses allow for the detection of artifacts that may be reported as false positive results. Proper sample preservation and handling ensure that sample results reflect the actual sample concentrations.

The data are assumed to be representative, with the exception of the TOC data. The sample were analyzed for TOC past the PSEP holding time. The TOC results may not be representative and have been qualified accordingly. The zinc detected in one method blank and the semivolatiles detected in the field blank do not impact the data because when compared to the sample concentrations, the blank concentrations are insignificant.

9.4 Comparability

Comparability is a measure of how easily the data set can be compared and combined with other data sets. The data are assumed to be comparable since standard EPA methods were used to analyze the samples, the method QC criteria were met, and routine detection limits were reported.

9.5 Completeness

Completeness is expressed as the ratio of valid results to the amount of data expected to be obtained under normal conditions. Completeness is determined by assessing the number of samples for which valid results were obtained versus the number of samples that were submitted to the laboratory for analysis. Valid results are results that are determined to be usable during the data validation review process.

The 90% completeness goal of the SAP was met. The completeness of this data set is 98.9%. The complete is less than 100% because the antimony results of the sediment samples were rejected due to a pattern of low spike recovery.

10.0 Definition of Data Qualifiers

10.1 Washington State Department of Ecology SEDQUAL Data Qualifiers

The following data validation qualifiers were used in the review of this data set. These qualifiers follow the SEDQUAL data flags (PSEP 1997), with two exceptions. The B qualifier definition is consistent with current usage, i.e., results were not blank corrected. The R qualifier has been added to denote unusable results.

B Analyte was detected in samples and in method blank

C Combined with unresolved substances

E Estimate

G Estimate is greater than value shown

K Detected at less than detection limit shown

L Value is less than the maximum shown

M Value is a mean

N Estimate based on presumptive evidence

Q Questionable value

T Detected below quantification limit shown

U Undetected at the detection limit shown*

W Post digestion spike outside control limits

X Recovery less than 10 percent

Z Blank-corrected, still above detection limit

R Result is rejected. See validation report for reasons for rejection.

* This qualifier was applied by the laboratory and was not added by the validation chemist.

11.0 References

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Table 2
Summary of Qualified Data

Sample ID	Analyte	Qualifier*	Reason for Qualification
SE060500MHB	Benzo(b)fluoranthene	UE	CCV percent difference > 25 (response decreased)
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035	Bis(2-ethylhexyl)phthalate	E	CCV percent difference > 25 (response increased)
SE060500MHB 034 SE060500MHB 035 Dilution SE060500MHB 036 Dilution	Pyrene	E	CCV percent difference > 25 (response increased)
SE050600MHB 033 SE050600MHB 034 SE050600MHB 035 SE050600MHB 036	Phenol	B	Analyte present in associated field blank
SE050600MHB 036	4-methylphenol	B	Analyte present in associated field blank
SE050600MHB 033 SE050600MHB 035	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluroanthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	R (in favor of dilution results)	Internal standard recovery of perylene-d_{12} below Functional Guidelines criteria
SE050600MHB 036	Pyrene Butylbenzylphthalate Benzo(a)anthracene Bis(2-ethylhexyl)phthalate Chrysene Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluroanthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	R (in favor of dilution results)	Internal standard recovery of chrysene-d_{12} and perylene-d_{12} below Functional Guidelines criteria
SE050600MHB 033 SE050600MHB 034 SE050600MHB 035 SE050600MHB 036	All semivolatile analytes flagged E by the laboratory	R	Result above the calibration range
SE050600MHB 033 Dilution SE050600MHB 034 Dilution SE050600MHB 035 Dilution SE050600MHB 036 Dilution	All semivolatile analytes for which the dilution was not required	R	Unnecessary result or elevated detection limit
SE050600MHB 034 Dilution	All pesticides and Aroclors	E positive results	Surrogate recovery below laboratory limits

Table 2 Continued

Sample ID	Analyte	Qualifier*	Reason for Qualification
SE050600MHB 033 (BS55A) SE050600MHB 034 (BS55B)	All pesticide and Aroclor results flagged E by the laboratory	R	Results above the calibration range
SE050600MHB 033 Dilution SE050600MHB 034 Dilution	All pesticide and Aroclor results for which the dilution was not required	R	Elevated detection limit and unnecessary results
SE050600MHB 036 (BU62D)	4,4'-DDD	UE	LCS recovery < 50%
SE050600MHB 033 (BZ19A) SE050600MHB 036 (BZ19D)	Aroclor 1260	UE	CCV percent difference > 15 (response decreased)
SE050600MHB 033 (BU62A) SE050600MHB 036 (BU62D)	All Aroclors	R (in favor of reanalysis)	Surrogates not added
SE050600MHB 033 (BZ19A) SE050600MHB 036 (BZ19D)	Aroclor 1242	UE	LCS recovery < 50%
SE050600MHB 033 (BS55A) SE050600MHB 036 (BS55D)	4,4'-DDD All Aroclors	R	Rejected in favor of fractionated results
SE050600MHB 033 (BU62A)	4,4'-DDD	R	Rejected in favor of re-extracted results
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Zinc	B	Analyte present in associated method blank
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Lead	E	Negative ICS concentration > 2X IDL and > 10% of sample result and comparable levels of interfering elements present
SE060500MHB 033	Arsenic	UE	Negative ICS concentration > IDL and comparable levels of interfering elements present
SE060500MHB 033	Mercury	E	Sample duplicate RPD value > 35
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Antimony	R	Pattern of low recovery (CRM and matrix spike)
SE060500MHB 033	Mercury Zinc	G	Matrix spike recovery < 75%
SE060500MHB 033 SE060500MHB 034 SE060500MHB 035 SE060500MHB 036	Iron	E	CRM recovery > 120%
SE050600MHB 033 SE050600MHB 034 SE050600MHB 035 SE050600MHB 036	TOC	E	Hold time exceeded

* When the same qualifier applies to all associated samples it is listed only once.

Appendix A

Laboratory Communications
26 pages

Analytical Resources, Inc.
333 Ninth Ave. North
Seattle, WA 98109-5187
206/621-6490
Fax: 206/621-7523

FAX

From: Kit Gardner For M. Harris

To: Kathy Gunderson Fax: 360-942-6060

Company:

Re: your Requests Pages: 7

CC:

Notes:

Rec'd 10-12 → KG

Kit Gardner

From: Mark Harris <mark@arilabs.com>
To: Kit Gardner <kit@arilabs.com>
Sent: Wednesday, October 11, 2000 11:43 AM
Subject: Fw: Anchor Navy Bank Phase 2 remaing issues

----- Original Message -----
From: Kathy Gunderson
To: Mark Harris
Sent: Monday, October 09, 2000 9:45 PM
Subject: Anchor Navy Bank Phase 2 remaing issues

Hi Mark,

I'm trying to tie up all the loose ends for Navy Bank and I'm still missing a couple of things from the early data packs: 3535

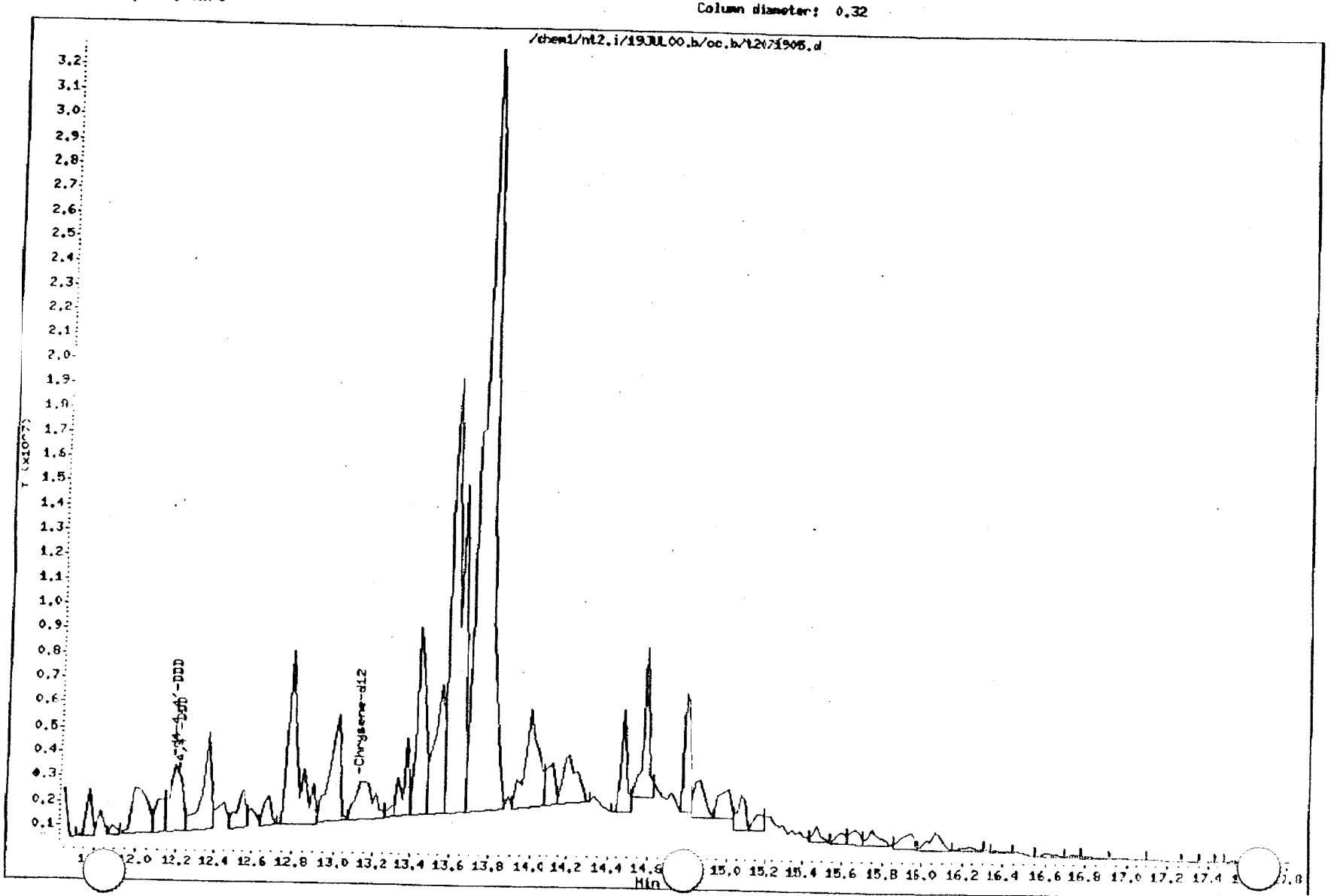
- For SDG BS55, I need the TOC solids data to recalculate the results. You sent the instrumental raw data already.
- For SDG BU62, I'm still missing the 4,4'-DDD spectra for sample 3528 036 (BU62D)

Thanks, Kathy
360-942-3409
fax 360-942-6060

Data File: /chem1/nt2.i/19JUL00.b/cc.b/t2071905.d
Date : 19-JUL-2000 21:57
Client ID: SE060500MHB 036
Sample Info: BU62-B(BACK-UP) (ANCHOR # SE060500MHB 036)
Volume Injected (uL): 10.0
Column phase: RTX-5

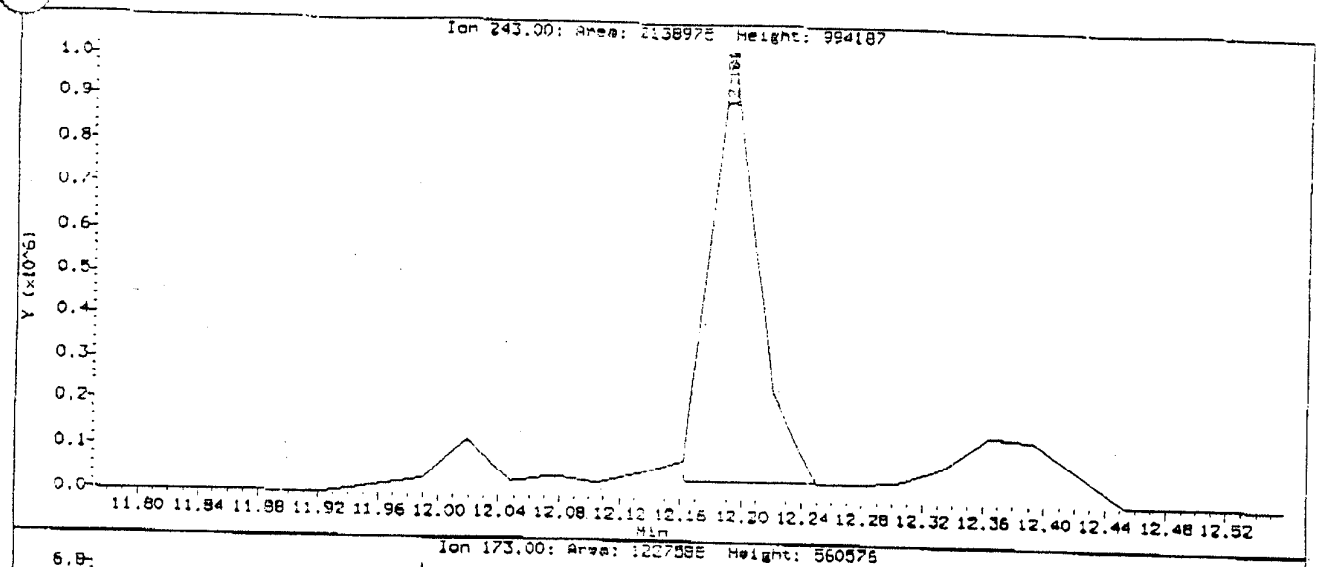
Instrument: nt2.i

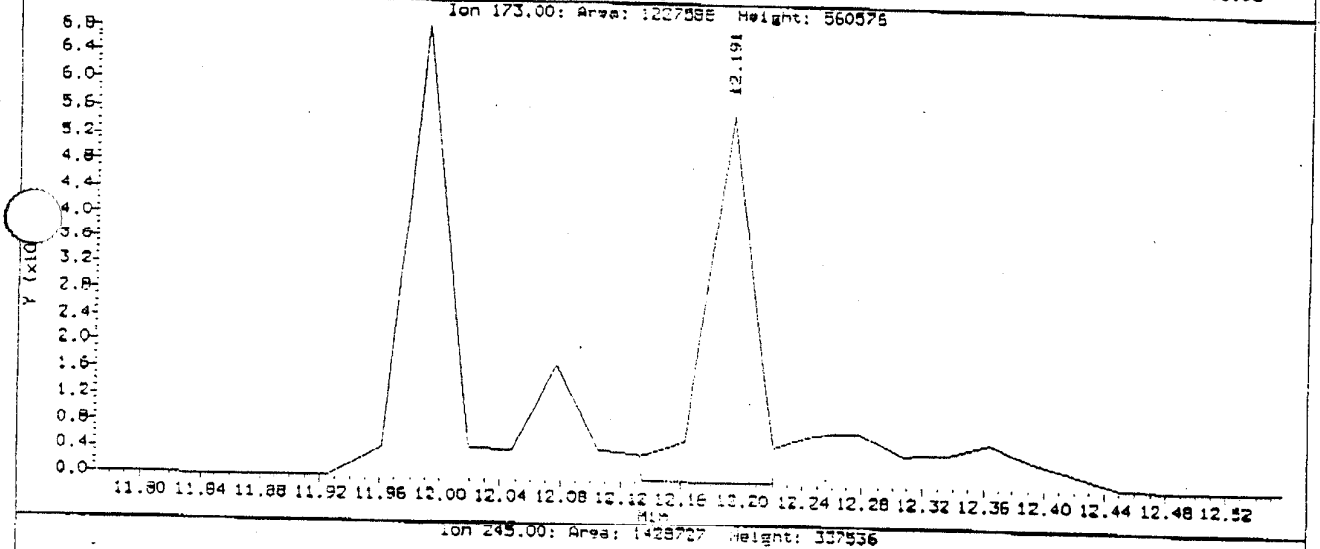
Operator: cm
Column diameter: 0.32

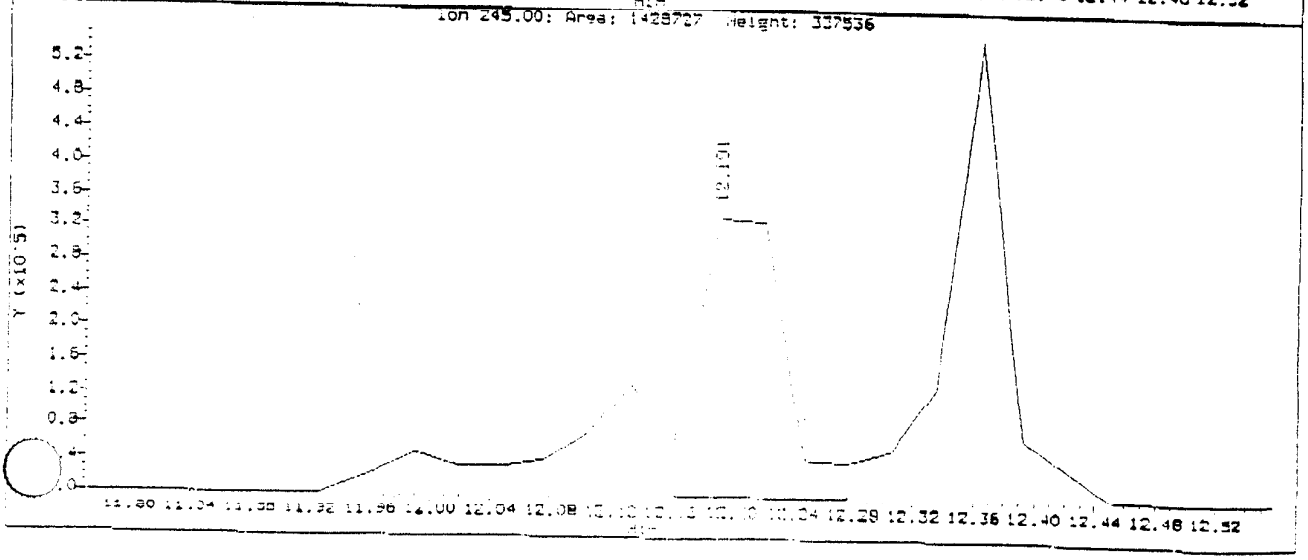


Data File: /chem1/nt2.1/19JUL00.b/ec.b/t2071905.d
Injection Date: 19-JUL-2000 21:57
Instrument: nt2.1
Client Sample ID: 5ZC060500MHB 036

Compound: d4-4,4'-DDD
Number:

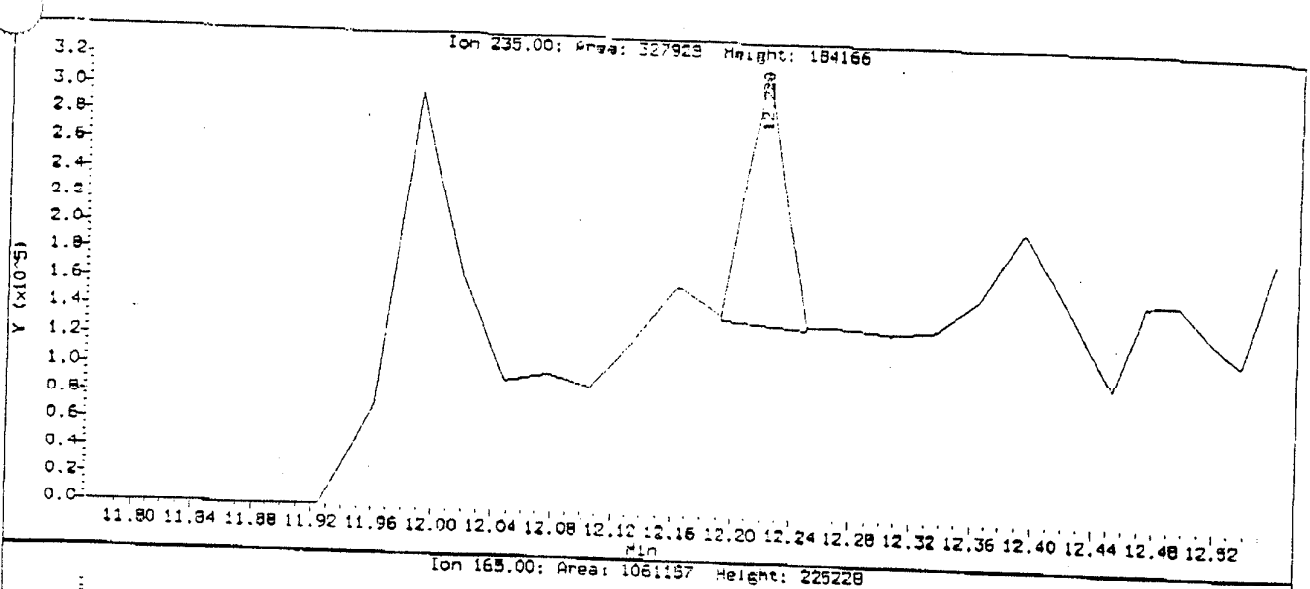


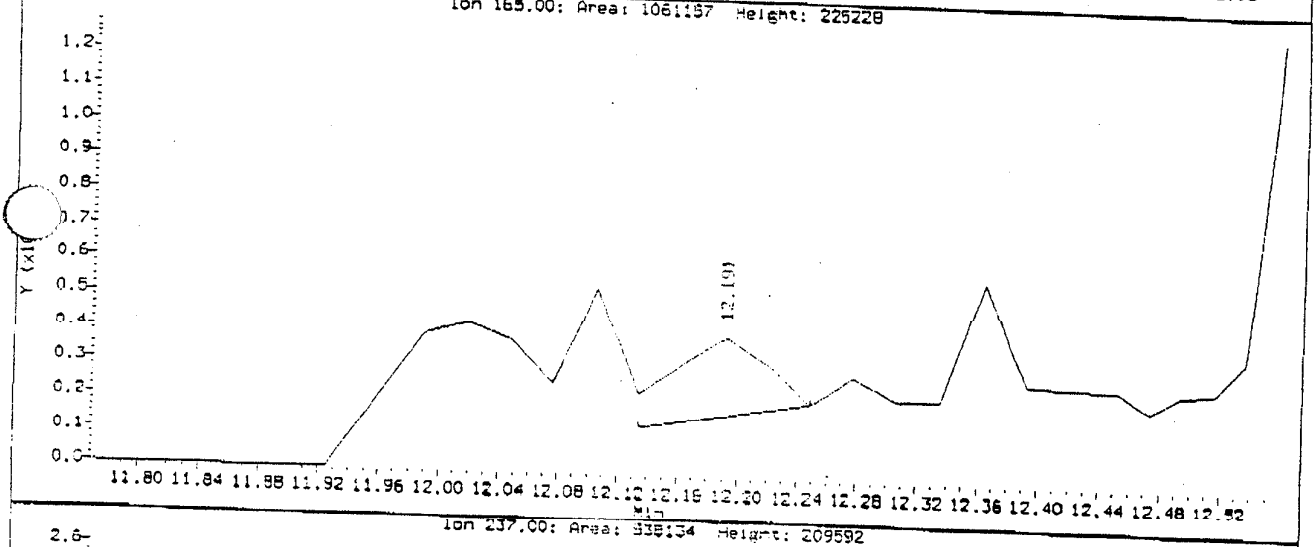


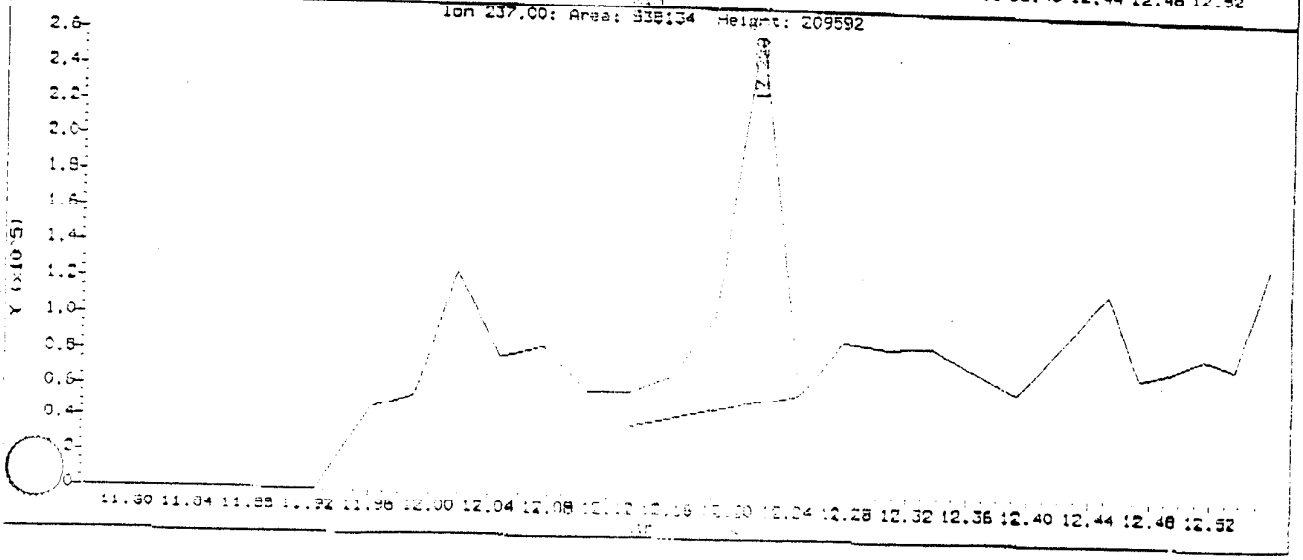


Data File: /chem1/mt2.i/19JUL00.b/ec.b/tz071905.d
Injection Date: 19-JUL-2000 21:57
Instrument: mt2.i
Client Sample ID: SE060500MMB 036

Compound: 4,4'-DDD
CAS Number:







70C Solids Prep Log

DATE:	6/7/00
ANALYST:	KAlex

70C drying and drying at 70C

General notes regarding prep method and samples

Sample ID		IC Test	Gravimetric Data (grams)			Purged	Notes
ARCI #	Client	+ / -	Tare Wt.	Wet wt.	70C dry wt	% Solids	
BLK			13.1064		13.1064	0.00%	
[illegible] A1	Anchor	-	13.2396	23.3899	20.7766	74.25%	sand & small rocks
[illegible] B1		-	13.1680	18.4900	15.9329	51.77%	sediment, rocks excluded
[illegible] B1Dup		-	13.1036	17.1618	15.2881	53.49%	RPD= 3.25%
[illegible] B1Trip		-	13.1724	16.6811	15.0739	54.19%	RPD= 5.34%
[illegible] C1		-	13.2228	16.3509	16.1834	61.45%	sediment
[illegible] C2		-	13.1634	17.0109	14.8969	45.05%	sediment, shells excluded
[illegible] A1	Pentec	-	13.1335	20.2332	19.1037	84.09%	small rocks
[illegible] B1		-	13.2262	19.9293	18.6038	80.23%	rocks & shell removed excluded
[illegible] B2		-	13.1040	19.9917	18.5604	80.39%	sand
[illegible] C1		-	13.1353	22.1999	20.9548	86.26%	sand
[illegible] E1		-	13.1522	16.7159	15.8452	75.57%	fine sand
[illegible] E1Dup		-	13.1452	17.5731	16.5275	76.39%	RPD= 1.08%
[illegible] E1Trip		-	13.1276	17.2573	16.2633	75.93%	RPD= 0.54%

ANALYTICAL RESOURCES INCORPORATED

ANALYSIS OF % SOLIDS ON SAMPLES PURGED FOR INORGANIC CARBON REMOVAL

(Purged [illegible] hours dried @ 70° C)

METHOD: [illegible] HCL/H2SO3; 10% HCL/FSODA[illegible]

DATE: [illegible]

ANALYST: [illegible]

CLIENT	SAMPLE ID	VIAL TARE WT (GM)	VIAL&SAMP. (GM)	FINAL WT (DRY)	PURGED % SOLIDS	(+)IHC (inorg. carb)
	[illegible]	[illegible]		13.1068		
	[illegible]	[illegible]		20.7766		
	[illegible]	[illegible]		15.2881		
	[illegible]	[illegible]		15.0739		
	[illegible]	[illegible]		15.9329		
	[illegible]	[illegible]		15.1634		
	[illegible]	[illegible]		14.5969		
	[illegible]	[illegible]		19.1637		
	[illegible]	[illegible]		16.5275		
	[illegible]	[illegible]		16.2633		
	[illegible]	[illegible]		18.6038		
	[illegible]	[illegible]		15.5604		
	[illegible]	[illegible]		20.4548		
	[illegible]	[illegible]		15.8452		

[illegible] Data Analysis

Model: NFCC   *Inlet:* Boat

Spike Std = 2,000 *ppm C*

DATE: 6/23/00	
ANALYST: MAP	

Calibration Data

Calibration Standard	Source:	ARI #77				Conc:	2,000 ppm
Observed Values (µg/g)					mean	*Cal Factor*	
1,526	1,679	1,542	1,598		1,586	*1.261*	
Verification Standard	Source:	SPEX 10-91AS				Conc:	5,000 ppm
ICV	CCV	CCV	CCV	CCV	*mean*	*% Rec*	
4,993					*4,993*	*99.9%*	
Standard Reference Material	Source:	*NBS 2704*				Conc:	33,480 ppm

Blank Data

System Blanks (enter "observed C")

Replicate determinations					Mean	condition
50.90	43.23	19.90			38.01	OK!

Silica Blanks (enter "corrected C" at end of run)

Replicate determinations					Mean	condition

Historical Blank Limits	
mean	*stdev*
25.1	12.59
updated	*10/6/99*
LBL	*-12.7*
UBL	*62.9*

Sample Data *(Entered data must match the Dohrmann output report!)*

"Corrected C" (no dilution) = "Observed C" - Mean Blank

*"Corrected C" (with dilution) = ("Observed C" - (Mean silica Blank * %Silica)) * Dilution Factor*

Sample ID	Dilution Data: Sample wt. (mg)	Final wt. (mg)	Silica (%)	Dilution Factor	Spike (µL Std)	Combustion Data: Burn wt. (mg)	Observed C (ppm C)	Corrected C (ppm C)	
Blank				1.00		10.0	38.01		*Blank OK*
ICV				1.00		10.0	4993	4,955	*99.10%*
NBS 2704				1.00		7.4	30130	30,092	*Offscale, dilute*
[illegible]				1.00		3.7	28500	28,462	*Range OK!*
[illegible]				1.00		6.1	22380	22,342	*Range OK!*
[illegible] dup				1.00		6.8	23090	23,052	*RPD=3.1%*
[illegible] trip				1.00		3.3	21070	21,032	*RSD=4.6%*
[illegible] ms				1.00	10	3.0	31360	31,322	*Range OK!*
Spike =	*0.02*	*mg C to*	*3.0*	*mg samp=*	*5,667*	*ppm*		*135%*	
[illegible] msd				1.00	10	3.5	27730	27,692	*Range OK!*
Spike =	*0.02*	*mg C to*	*3.5*	*mg samp=*	*5,714*	*ppm*		*94%*	
CCV				1.00		10.0	5154	5,116	*102.32%*
Blank				1.00		10.0	0.098		*Blank OK*
[illegible] ms				1.00	10	5.3	24830	24,792	*Range OK!*
Spike =	*0.02*	*mg C to*	*5.3*	*mg samp=*	*3,774*	*ppm*		*65%*	
[illegible] msd				1.00	10	6.0	25790	25,752	*Range OK!*
Spike =	*0.02*	*mg C to*	*6.0*	*mg samp=*	*3,333*	*ppm*		*102%*	
[illegible]				1.00		5.5	20670	20,632	*Range OK!*
[illegible]				1.00		6.9	29360	29,322	*Offscale, dilute*
[illegible]				1.00		3.7	29300	29,262	*Range OK!*
[illegible]				1.00		10.0	39.61		*Blank OK*
[illegible]				1.00		10.0	4980	4,942	*98.84%*

ANALYTICAL
RESOURCES
INCORPORATED

[illegible] Solids Sample Run Log

Date: 6-23-[illegible]

Analyst: [illegible]

Page 1 of 1

Set-Up Parameters

MODE: NPOC INLET: BOAT

Standards

	Source	Conc (ppm)
Calibration	[illegible] # 77	2000
Verification	[illegible] # 1731	2000
SRM	[illegible] # 2704	

Sample Sequence

Sample ID	Dilution Data (mg) sample	Dilution Data (mg) sample + SiGel	burn wt (mg)	Matrix Spike Data mg/L	Matrix Spike Data µL added	Comments
[illegible]			10			[illegible]
[illegible]			10			4 replicate CF=1.261
[illegible]			10			1 burn [illegible]
[illegible]			10			2 reps [illegible]
[illegible]			17, 5.5, 4.7			3 reps [illegible]
[illegible]			8.4			reject offscale
[illegible]			5.6			offscale
[illegible]			3.7			accept [illegible]
[illegible]			6.1			single burn
[illegible]			6.5			" "
[illegible]			3.5			
[illegible]			3.0	2000	10	
[illegible]			3.5	2000	10	
[illegible]			4.4	2000	10	no peak [illegible]
[illegible]	[illegible] failure - replaced [illegible]					
[illegible]			10			ok [illegible]
[illegible]			10			ok [illegible]
[illegible]			3.0	2000	10	[illegible] peak
[illegible]			5.3	2000	10	[illegible] peak
[illegible]			6.0	2000	10	
[illegible]			5.5			1 burn
[illegible]			6.9			offscale
[illegible]			5.8			[illegible]
[illegible]			3.7			
[illegible]			10			
			10			[illegible]
			10			
			10			

Analytical Resources Inc.
Dual Column Pesticide Quantitation Report

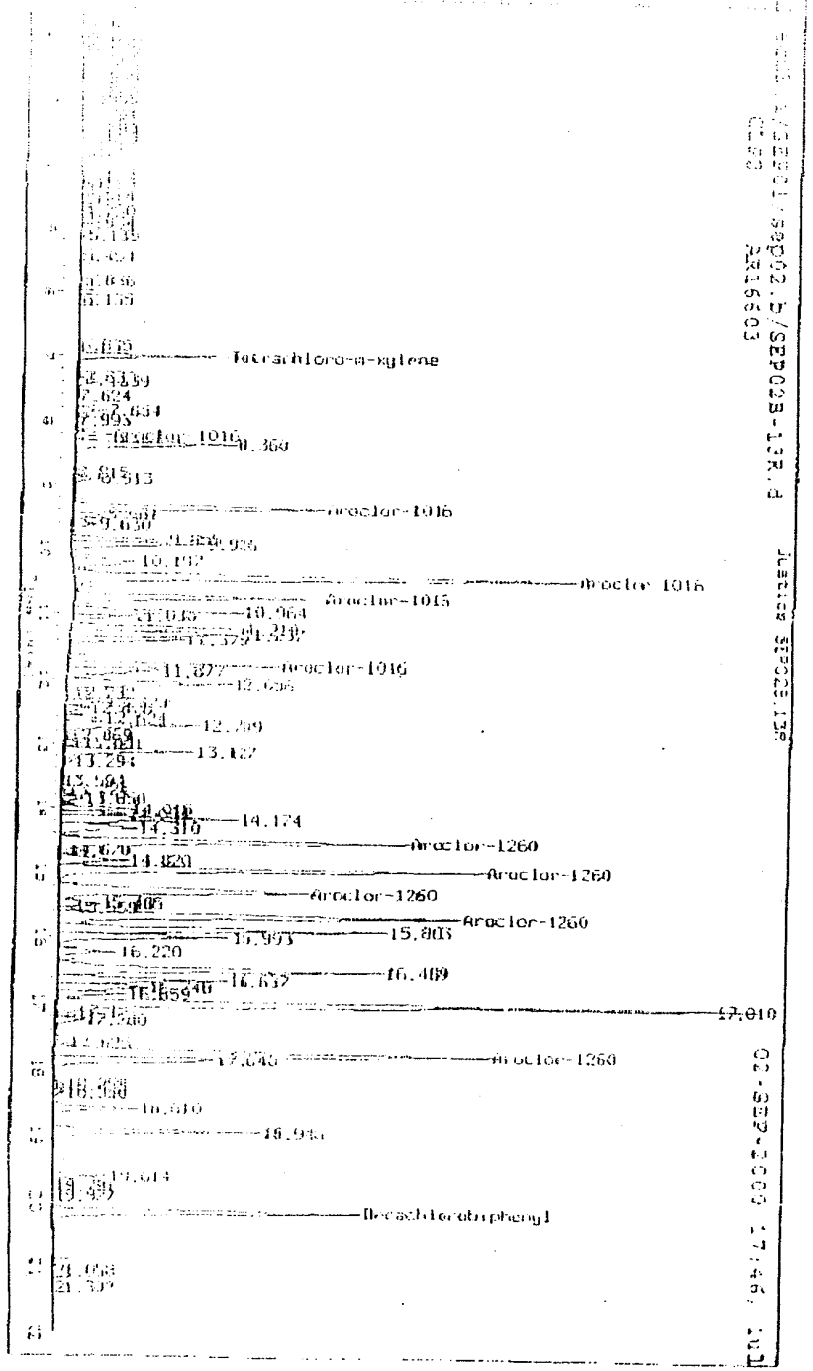
Data file 1: /chem2/ecd3.i/SEP01/sep02.b/SEP02-13R.d
Data file 2: /chem2/ecd3.i/SEP01/sep02.b/SEP02B-13R.d
Method: /chem2/ecd3.i/SEP01/PCB0901.m
Compound Sublist: AR1660
Instrument, Inj. Vol.: ecd3.i, 1ul
Operator: CH

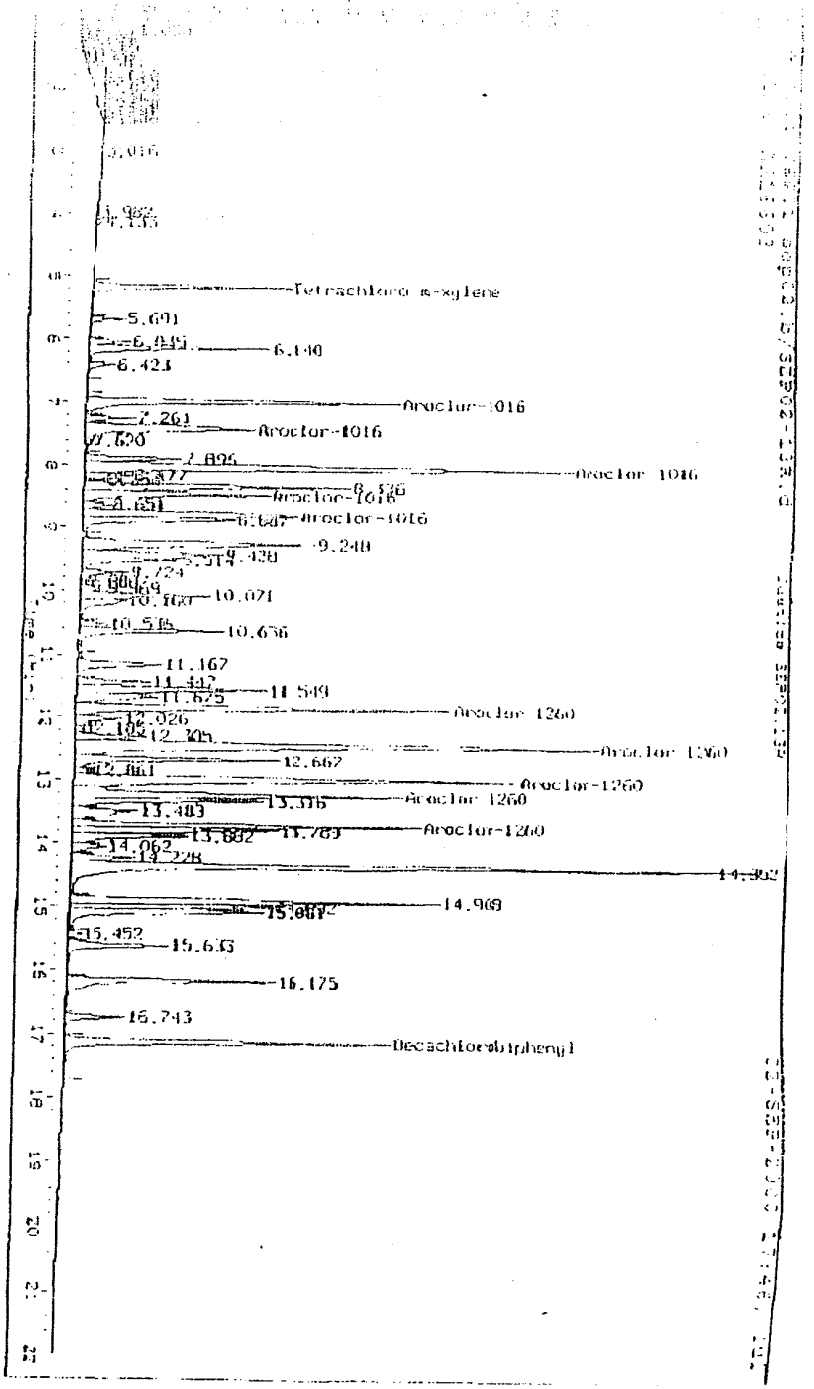
ARI ID: AR16603
Client ID: AR16603
Injection Date: 02-SEP-2000 17:46
Report Date: 09/04/2000 11:36
Matrix: NONE
Dilution Factor: 1.000

CLP1 Col RT	CLP1 Col Shift	CLP1 Col Response	CLP2 Col RT	CLP2 Col Shift	CLP2 Col Response	CLP1 on col	CLP2 on col	RPD	Compound
5.174	0.002	58445	7.003	0.001	53602	0.0201	0.0198	1.6	Tetrachloro-m-xylene
17.119	0.002	96156	20.145	0.000	112434	0.0389	0.0385	1.1	Decachlorobiphenyl

Post-it® Fax Note 7671 | Date 9/5/00 | # of pages ▶ 3
To KATHY GUILFORD | From MARK HANEY
Co./Dept. | Co. ARI
Phone # 360/942-3455 | Phone # 206/789-6160
Fax # 360/942-4060 | Fax #

Peaks	CLP1 Col RT	Shift	Height	Amount	Peaks	CLP2 Col RT	Shift	Height	Amount
[illegible]	6.989	0.003	92382	1.017	1	8.214	0.003	13214	1.004
[illegible]	7.439	0.003	90120	1.042	2	9.369	0.002	90965	1.033
[illegible]	8.041	0.002	144745	1.100	3	10.427	0.001	160180	1.058
[illegible]	8.470	0.002	84910	1.060	4	10.735	0.002	89521	1.051
[illegible]	8.810	0.001	64166	1.050	5	11.791	0.000	76738	1.050
Total CLP1Ave (5 peaks): 1.058					Total CLP2Ave (5 peaks): 1.033 RPD = 2				
Corrected Ave (5 peaks): 1.058					Corrected Ave (5 peaks): 1.033 RPD = 2				
[illegible]	11.837	0.003	110481	0.913	1	14.508	0.003	126296	0.894
[illegible]	12.417	0.004	155491	0.905	2	14.952	0.003	153311	0.902
[illegible]	12.978	0.004	131644	0.873	3	15.490	0.006	90917	0.905
[illegible]	13.324	0.003	97041	1.052	4	15.688	0.002	145308	0.862
[illegible]	13.714	0.003	102798	1.024	5	17.759	0.001	137120	1.017
Total CLP1Ave (5 peaks): 0.953					Total CLP2Ave (5 peaks): 0.920 RPD = 4				
Corrected Ave (5 peaks): 0.953					Corrected Ave (5 peaks): 0.920 RPD = 4				


Tetrachloro-m-xylene
Aroclor-1016
Aroclor-1016
Aroclor 1016
Aroclor-1016
Aroclor-1260
Aroclor-1260
Aroclor-1260
Aroclor-1260
Decachlorobiphenyl


Tetrachloro-m-xylene
5.691
6.140
6.423
Aroclor-1016
7.261
Aroclor-1016
7.825
Aroclor 1016
Aroclor-1016
Aroclor-1016
9.240
10.071
10.656
11.167
11.549
Aroclor 1260
Aroclor 1260
12.667
Aroclor-1260
13.315
Aroclor 1260
13.783
Aroclor-1260
14.062
14.969
15.452
15.653
16.175
16.743
Decachlorobiphenyl

Main Identity

From: "Mark Harris" <mark@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Monday, October 09, 2000 1:34 PM
Subject: Re: Anchor Navy Bank Phase 2 BZ19

1) They were shipped UPS on the 18 and received by DMD on the 22. UPS does not sign COCs.
2) No. Once extracted this is not critical.
3) This would be a Kim Magruder question. I suspect the levels did not require its re-analysis.
4) Will fax.

----- Original Message -----
From: Kathy Gunderson
To: Mark Harris
Sent: Sunday, October 08, 2000 7:34 PM
Subject: Anchor Navy Bank Phase 2 BZ19

Hi Mark,

Thanks for sending BZ19. I only have a couple of questions.

1. How were the extracts transferred to DMD? >From the COC, it appears to have taken 4 days (from the 18th to the 22nd)?
2. Were the extracts transported cold?
3. The DDD analyses, why wasn't sample SE060500MHB 036 analyzed?
4. The aroclor quantitation report and chromatogram are missing for the CCV analyzed 9-2-00 at 17:46 (see page 182).

This report is due to Kim on Monday, but Tuesday or Wednesday is more realistic. Can we resolve these issues by Tuesday? Please let me know if that's not possible.

Thanks, Kathy
360-942-3409
fax 360-942-6060

Main Identity

From: "Mark Harris" <mark@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Monday, October 02, 2000 3:37 PM
Subject: BU62-ABNs

There was an entry error (0.119 instead of 0.1119) so your result should be correct. (4.24 instead of 4.5). We're correcting the hard copy but it probably won't go out until tomorrow.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

FAX

Date: October 2, 2000
From: Mark D. Harris, ARI, 206/389-6150
RE: Anchor/ThermoRetec

Pages (incl. cover): 2

To: Kathy Gunderson
360/942-8060

Here's the new form I for the Anchor sample.

Also, for the ABN QC limits for Gas Works Park, essentially, Charles is not using the new limits as they aren't too practical. He's using the old limits which are from about 30% up to about 150%. QA is generating the new limits and as they tightened up to impractical levels, he defaulted to the old limits. Our intent is to come to some happy medium where we use the new limits as advisory but default to an 'action level'. QA and the lab manager and the ABN lab will have to come to some final agreement. In the meantime, I think the GWP data were okay even though they didn't always meet the new limits.

2377 Eighth Avenue North • Seattle WA 98109-5187 • 206-621-6490 • 206-621-7523 fax

Sample No: SD060500MB 001

ANALYTICAL RESOURCES INCORPORATED

Client Sample ID: SD62A
ARI ID: 00-10822
Matrix: Sediment
Data Release Authorized:
Reported: 10/02/00

QC Report No: SD62-Anchor Environmental
Project: Navy Bank
99-049-09(1)
Date Sampled: 06/05/00
Date Received: 06/06/00

Date Extracted: 06/28/00
Date Analyzed: 07/19/00 22:26
Instrument: HR2
GPC Cleanup: Yes

Sample Amount: 52.8 g-dry-wt
Final Extract Volume: 2.0 mL
Conc/Dilution Factor: 1:1
Moisture: 29.7%
pH: 7.2

CAS Number	Analyte	ug/kg
72-54-8	4,4'-DDD	4.2

SDM Surrogate Recovery	
d4-4,4'-DDD	177%

Main Identity

From: "Mark Harris" <mark@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Saturday, September 30, 2000 11:46 AM
Subject: Re: Anchor Navy Bank Phase 2 P/PCBs BS55

It may be that since the recoveries were demonstrated in the un-diluted analysis, it wasn't relevant. I can check with Craig or Sue on Monday if you like.

----- Original Message -----
From: Kathy Gunderson
To: Mark Harris
Sent: Monday, September 18, 2000 4:51 PM
Subject: Anchor Navy Bank Phase 2 P/PCBs BS55

Mark,

Just 1 question about the BS55 P/PCBs:

- For the dilution of sample SE060500MHB 034 (BS55B), TCMX was reported from the CLP1 column at 210%. Should the CLP2 value of 121% be reported instead?

Thanks, Kathy
360-942-3409
fax 360-942-6060

Main Identity

From: "Mark Harris" <mark@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Saturday, September 30, 2000 11:35 AM
Subject: Re: Anchor Navy Bank Phase 2 Fractionated DDD

Charles will ahve to look at the calculation. I think he's coming in Sunday so I'll see what's waiting Monday morning.

SIM-DDD was not required on the second sample.

These were re-done as BZ19.

----- Original Message -----
From: Kathy Gunderson
To: Mark Harris
Sent: Thursday, September 21, 2000 2:09 PM
Subject: Anchor Navy Bank Phase 2 Fractionated DDD

Hi Mark,

I have a couple of questions about BU62 DDD data:

1. For sample SE060500MHB 033 (BU62A) the DDD result is reported as 4.5 ug/kg. I calculated the result as 4.24 ug/kg. Please check the calculation.
2. The DDD spectra for sample SE060500MHB 036 (BU62D) is missing from the data package (see page 187).
3. The LCS recovery is below the PSEP QA2 criteria (50-150%) at 24.3%. Were the samples re-extracted or reanalyzed?

Thanks, Kathy
350-942-3409
fax 360-942-6060

Main Identity

From: "Mark Harris" <mark@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Saturday, September 30, 2000 11:34 AM
Subject: Re: Anchor Navy Bank Phase 2 (SVOA BS55)

Only ...034 was actually re-extracted. The rest were merely diluted. That was a mis-statement in my narrative. The other samples were diluted and the internal standards were okay for the dilutions.

IS1: through hexachloroethane
IS2: d5-nitrobenzene through 2-methylnaphthalene
IS3: hexachlorocyclopentadiene through 4,6-dinitro-2-methylphenol
IS4: N-nitrosodiphenylamine through fluoranthene, except 2,4,6-tribromophenol is linked to IS3
IS5: pyrene through bis(2-ethylhexyl)phthalate
IS6: Di-n-octyl phthalate through the end

----- Original Message -----
From: Kathy Gunderson
To: Mark Harris
Sent: Sunday, September 17, 2000 11:55 AM
Subject: Anchor Navy Bank Phase 2 (SVOA BS55)

Hi Mark,

I'm getting a late start on the Navy Bank data. So far, I've only reviewed the SVOAs.

1. The case narrative says the samples were re-extracted, reanalyzed, and two sets of results were reported due to low internal standard recovery. The data package only contains one set of results from one extraction batch (one sample was re-extracted due to low surrogate recovery). The internal standards are all acceptable in the diluted analyses. Were the samples actually re-extracted?
2. Please send the internal standard associations, i.e., which analytes were quantitated on which internal standard.

I have the original data packages here, so please send any hard copies to me. The TAT is short for this project. I will need all items wrapped up by Wednesday (9-20-00). (I hope to get through all the data by Monday.)

Thanks, Kathy
360-942-3409
fax 360-942-6060

Main Identity

From: "Matthew D. Bates" <matt@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Wednesday, September 27, 2000 9:32 AM
Attach: bz19.xls
Subject: Navy Bank EDDs-BZ19

Kathy,

The EDDs for Navy Bank job BZ19 are attached. Please contact me if you have any questions regarding the EDDs.

Sincerely,

Matthew D. Bates
Analytical Resources, Inc.
matt@arilabs.com
(206) 389-6179

Main Identity

From: "Mark Harris" <mark@arilabs.com>
To: "Kathy Gunderson" <kathyg@willapabay.org>
Sent: Thursday, September 21, 2000 2:17 PM
Subject: Re: Anchor Navy Bank Phase 2

Okay. These were re-done. The Arolcors are finished. The problem is with the SIM-pests. Charles has run them and it appears that he was questioning something but I'm not positive what it was. The surrogate recovery looks a little low in the LCS but that's all I can see. We're leaving him notes and hopefully he'll wrap that up within a day or so.

mdh

----- Original Message -----
From: Kathy Gunderson
To: Mark Harris
Sent: Wednesday, September 20, 2000 11:02 AM
Subject: Anchor Navy Bank Phase 2

Hi Mark,

Thanks for the TOC raw data. I still need the TOC percent solids to recalc the results.

For the fractionated pesticide and PCBs, were both the DDDs and PCBs redone after the poor recovery of SDG BU62?

Thanks, Kathy
360-942-3409
fax 360-942-6060

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: BZ19MB
LIMS ID: 00-13513
Matrix: Sediment

QC Report No: BZ19-Anchor Environmental
Project: Navy Bank
99-049-09(2)
Date Sampled: NA
Date Received: NA

Data Release Authorized: CM 9/8/00
Reported: 09/08/00

Date extracted: 08/16/00
Date analyzed: 09/02/00 11:16
Instrument ID: ECD3
Sample Amount: 50.0 g-dry-wt
Final Ext Vol: 2.0 mL
pH: NA

GPC Cleanup: Yes
Florisil Cleanup: No

Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	4.0 U
53469-21-9	Aroclor 1242	4.0 U
12672-29-6	Aroclor 1248	4.0 U
11097-69-1	Aroclor 1254	4.0 U
11096-82-5	Aroclor 1260	4.0 U
11104-28-2	Aroclor 1221	8.0 U
11141-16-5	Aroclor 1232	4.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	63.8%

RE-DO

Data Qualifiers

J Indicates an [illegible] value when that result is les[illegible]
calculated [illegible] it.
E Indicates [illegible] the linear range of th[illegible]
Dilut[illegible]
S In[illegible] due to satura[illegible]
D [illegible] luted ou[illegible]
U [illegible] ed for[illegible]

[illegible]od bla[illegible]
[illegible]as not [illegible]
[illegible]very du[illegible]
[illegible]alue repo[illegible]
[illegible] raised report.
[illegible]yte may be present [illegible]es.
[illegible]n the opinion of the ana[illegible] [illegible]nterferences.
[illegible]ad concentration,
[illegible]ion was inadequate.

Post-it® Fax Note 7671 | Date 9/8/00 | # of pages ▶ 4
To KATHY GILLILAND | From MARK MAYFIELD
Co./Dept. | Co. ARI
Phone # | Phone # 206/695-6200
Fax # 907-562-6063 | Fax # 907-562-9135

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SE060500MB 033

Lab Sample ID: BZ19A
LIMS ID: 00-13513
Matrix: Sediment

QC Report No: BZ19-Anchor Environmental
Project: Navy Bank
99-049-09(1)
Date Sampled: 06/05/00
Date Received: 06/05/00

Data Release Authorized: CH
Reported: 09/08/00 9/8/00

Date extracted: 08/16/00
Date analyzed: 09/02/00 12:26
Instrument ID: ECD3
Sample Amount: 53.1 g-dry-wt
Final Ext Vol: 2.0 mL
pH: 7.1

GPC Cleanup: Yes
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 18.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	3.8 U
53469-21-9	Aroclor 1242	93 Y
12672-29-6	Aroclor 1248	3.8 U
11097-69-1	Aroclor 1254	75 Y
11096-82-5	Aroclor 1260	36 Y
11104-28-2	Aroclor 1221	7.5 U
11141-16-5	Aroclor 1232	3.8 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	109%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: SE060500MBB 036

Lab Sample ID: BZ19D
LIMS ID: 00-13514
Matrix: Sediment

QC Report No: BZ19-Anchor Environmental
Project: Navy Bank
99-049-09(1)
Date Sampled: 06/05/00
Date Received: 06/05/00

Data Release Authorized: CK 9/13/00
Reported: 09/08/00

Date extracted: 08/16/00
Date analyzed: 09/02/00 13:01
Instrument ID: ECD3
Sample Amount: 51.2 g-dry-wt
Final Ext Vol: 2.0 mL
pH: 7.1

GPC Cleanup: Yes
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1.1
Percent Moisture: 55.5%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	3.9 U
53469-21-9	Aroclor 1242	69 Y
12672-29-6	Aroclor 1248	150 Y
11097-69-1	Aroclor 1254	81 Y
11096-82-5	Aroclor 1260	27 Y
11104-28-2	Aroclor 1221	7.8 U
11141-16-5	Aroclor 1232	3.9 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	NR

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Sediment

QC Report No: BZ19
Project: Navy Bank
99-049-09(1)

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-13513MB	081600MB	Method Blank	63.8%		104%		0
00-13513SB	081600SB	Lab Control	1.2%	*	94.2%		1
00-13513	BZ19A	SE060500MHB 033	109%		NR	*	1
00-13514	BZ19D	SE060500MHB 036	NR	*	NR	*	2

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(33-134)
(DCBP) = Decachlorobiphenyl	(43-155)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: BZ19
LIMS ID: 00-13513
Matrix: Sediment

QC Report No: BZ19-Anchor Environmental
Project: Navy Bank
99-049-09(1)

Data Release Authorized: CH
Reported: 09/08/00
9/1/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 08/16/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	11.9	40.0	29.8%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	94.2%
Tetrachlorometaxylene	1.2%

Values Reported in Total ug/kg Dry Weight

APPENDIX E
Bioassay Data Validation Report

BIOASSAY QUALITY ASSURANCE REVIEW

The following review is based on the guidelines set forth in the Puget Sound Estuary Protocols (PSEP 1995) for bioassays with revisions identified in subsequent Sediment Management Annual Review Meeting (SMARM) updates (DMMO 2000) and in *Data Validation Guidance Manual for Selected Sediment Variables* (PTI 1989). The data reports for the toxicity tests using the amphipod *Eohaustorius estuarius*, the larvae of the bivalve *Mytilus galloprovincialis*, and the juvenile polychaete *Neanthes arenaceodentata* were reviewed. These toxicity tests were conducted on three surface sediment samples collected at the Navy Bank site in the Hylebos Waterway of Commencement Bay, Washington and two Carr Inlet reference stations. All toxicity tests were conducted by EVS Bioassay Laboratory, North Vancouver, BC (EVS 2000).

BIOASSAYS

The toxicity tests were each conducted on three test sediments, two reference sediments, and one negative control. The 10-day amphipod and 20-day juvenile polychaete toxicity tests were initiated July 6, 2000. The 48-hour larval bivalve toxicity test was initiated on July 18, 2000. The measurement endpoints included mean percent survival and sediment avoidance for the amphipods, survival and percent abnormality for the bivalve larvae, and mortality and growth for the polychaetes.

SAMPLE COLLECTION, TRANSPORT, AND STORAGE

Samples were collected, transported, and stored in accordance with the procedures outlined in the Sampling and Analysis Plan (CRA, 2000). Samples were stored in the dark at 4°C at the laboratory.

DATA COMPLETENESS AND FORMAT

Information regarding the responses, experimental conditions, control results, and conditions influencing data quality were included in the data report provided by the testing laboratory.

DATA VALIDATION AND ASSESSMENT

Analytical Methods

Organism holding and acclimatization periods were carefully controlled. All tests were conducted using randomly distributed identical test chambers filled with the appropriate

amount of test sediment and overlying water. Testing procedures followed PSEP guidelines for testing, including water quality, with the exceptions discussed below.

Amphipod Test

There were no deviations from PSEP protocols (PSEP 1995) and all water quality parameters during the test were within acceptable ranges. High concentrations (>15 mg/L) of ammonia-N were measured in the interstitial sediment porewater of test sediments MHB-035 and MHB-036 at test initiation. The concentrations dropped throughout the test period and did not appear to affect the results of the test. The total sulfide concentration in the bulk interstitial water of reference sediment CR-23W was 28 mg/L two days prior to test initiation. Subsequent measurements of overlying porewater concentrations during the test did not detect (detection limit 0.02mg/L) total sulfides in the CR-23W reference sediment. Total sulfide concentrations in CR-23W did not appear to affect the results of the test.

The mean percent survival among amphipods in the seawater control and reference sediments met the PSEP criteria and SMS performance standards for test acceptability. Percent fine sediment (silt + clay) in test and reference sediments were appropriately matched for comparison of results to SMS criteria.

Bivalve Larval Test

There were no deviations from PSEP protocols (PSEP 1995) and all water quality parameters during the test were within acceptable ranges. The mean percent/normal larvae in the seawater control and reference sediment CR-24 met the PSEP criteria (PSEP 1995) and SMS performance standards for test acceptability. Reference sediment CR-23W did not achieve SMS performance standards for survival and therefore does not provide a valid measure of comparison for evaluating test sediment results to SMS criteria. Upon approval from Washington Department of Ecology, it is recommended that the seawater control results are substituted for CR-23W results for evaluating test sediment MHB-035 results to SMS criteria.

Juvenile Polychaete Test

There were no deviations from PSEP protocols (PSEP 1995) and all water quality parameters during the test were within acceptable ranges. High concentrations (>15 mg/L) of ammonia-N were measured in the interstitial sediment porewater of test sediments MHB-035 and MHB-036 at test initiation. The concentrations dropped throughout the test period and did not appear to affect the results of the test.

The mean individual growth rate and survival in the seawater control and reference sediments met the PSEP criteria (PSEP 1995) and SMS performance standards for test

acceptability. Percent fine sediment (silt + clay) in test and reference sediments were appropriately matched for comparison of results to SMS criteria.

Test Precision

Replicate analyses, sample homogenization, and larval counts were adequately performed to assure test precision.

Positive Controls

Reference toxicant tests were conducted concurrently with each sediment toxicity test. The results of each of the reference toxicant tests for amphipods, bivalve larvae, and juvenile polychaetes were within the acceptable ranges established by the laboratory.

Negative Controls

A negative control test was conducted concurrently with each sediment toxicity test. The mean performance of the negative control samples for the amphipod, bivalve larvae, and juvenile polychaetes met the SMS performance criteria, therefore indicating that the tests were valid.

CONCLUSION

The data from the Navy Bank surface sediment toxicity tests are complete with respect to the requirements outlined for this data quality review. The conclusion of this review is that the test results for amphipod, bivalve larvae, and juvenile polychaete are usable as reported.

REFERENCES

CRA. 2000. Work Plan and Sampling and Analysis Plan – Characterization of the Navy Bank Area. Phase 1 Hylebos Mouth Cleanup. Prepared for the Port of Tacoma and Occidental Chemical Corporation, Tacoma, Washington. Prepared by Conestoga-Rovers & Associates, Niagara Fall, New York. January 2000.

DMMO. 2000. Program modifications made through the annual review process and workshops. U. S. Army Corps of Engineers, Seattle District, Dredged Material Management Office. Seattle, Washington. http://www.nws.usace.army.mil/dmmo/by_topic.html

EVS. 2000. Report for Navy Bank Project. Prepared for Anchor Environmental, Seattle, Washington. Prepared by EVS Environment Consultants, North Vancouver, British Columbia, Canada. August, 2000.

PSEP. 1995. Recommended guidelines for conducting laboratory bioassays on Puget Sound sediments. Prepared for U.S. Environmental Protection Agency, Region 10. Seattle, Washington. Puget Sound Estuary Program, Seattle, Washington.

PTI. 1989. Data validation guidance manual for selected sediment variables. Prepared for Washington Department of Ecology, Olympia, Washington. June 1989 draft.